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Planting date and soybean diseases

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Abstract

We know that planting date affects soybean diseases and that delayed planting is a useful management tool to reduce the risk of some diseases, especially in regions with a long planting season. However, research by Iowa agronomists shows that early planting increases the possibility of achieving maximum yield and that the level of success decreases as planting is delayed. Because of narrow planting windows for high yield, especially in northern Iowa, the value of delayed planting for disease management is less in Iowa than in other regions with a longer planting season.

Keywords

Plant Pathology

Disciplines

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Importantly, diseases respond to planting date differently. Early or delayed planting may increase, reduce, or not affect a soybean disease, depending on when the disease infects soybean. Table 1 summarizes how planting date may affect major Iowa soybean diseases. Keep in mind that if your fields had no disease problems in the past, diseases should not be a concern. If you have experienced soybean diseases in your fields, this table may be useful to avoid future disease problems.

Reduced risk by delayed planting. For diseases in which infection occurs at the seedling stage, planting date directly affects disease risk. Sudden death syndrome (SDS) caused by *Fusarium solani* and seedling blight caused by *Pythium* require cold soil temperatures when soybeans are in the seedling stage. Therefore, soybeans will have a higher risk of the two diseases if planted early in cool and wet soils. If these diseases were severe in the past, delay planting until the soil warms up and you can reduce disease risk significantly. In Iowa, severe SDS is more likely to be found in early-planted soybean fields than in late-planted fields. Be aware that the fungi will not cause much damage if soil moisture is not excessive. When spring conditions are not unusually wet, diseases may not be a concern.

Reduced risk by early planting. Contrary to *Pythium* damping-off and SDS, seedling blight by *Rhizoctonia* and *Phytophthora* may be reduced by using early planting because optimum conditions for infections by the two fungi are warm soil temperatures. If planted early, soybeans may grow out of the susceptible seedling stage and escape damping-off.

No effects. Some diseases, such as the root rot phase of *Phytophthora*, bacterial blight, brown spots, and stem canker, are not affected by planting dates because their infections can occur throughout the growing season.

Indirect effects. Planting date also indirectly affects occurrence of white mold, pod and stem blight, and brown stem rot. Infections of the first two diseases do not occur in seedling stages, but there is a certain window of time during which soybeans are susceptible to these pathogens. Soybeans planted at different times in the spring will reach a disease-susceptible stage at different times in the summer—some early, some later. A planting whose

window of susceptible stages overlaps with disease-favorable weather conditions will have higher risk of developing disease than a planting whose window misses the disease-favorable weather. For example, in 1996 more white mold was observed in late-planted soybeans because the cool and wet weather came late in the season. Similarly, the susceptible growth stage for pod and stem blight is in the pod-setting stage, and favorable weather during this growth stage affects the level of this disease.

Iowa has a short planting season for maximum yield. But if you farm a large acreage and have fields that have disease problems, arranging planting order is important in reducing disease risk. For example, if you have five fields and one of them had *Pythium* damping-off in the past, you can reduce disease risk in warmer soil by planting the infested field last.

Effects of planting date on soybean diseases for fields where disease is a concern.

Disease	Conditions for infection	Growth stage for infection	Planting date effect
Damping-off by <i>Pythium</i>	cool and wet soil	before V2	delayed planting reduces risk
Damping-off by <i>Rhizoctonia</i>	warm soil	before V2	early planting may reduce the problem
Damping-off by <i>Phytophthora</i>	warm and wet soil	seedling stage	early planting may reduce the problem
Sudden death syndrome	cool and wet soil	early growth stage	delayed planting reduces risk
Brown stem rot	cool and wet weather	all vegetative growth stages	varies, often more severe in late mature soybeans
White mold	cool and wet weather	flowering stage	varies with weather in flowering stage
Pod and stem blight	cool and wet weather	pod setting	varies with weather during pod setting

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